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EXAMINER	
LUCAS, ZACHARIAH	

ART UNIT	PAPER NUMBER
1648	

NOTIFICATION DATE	DELIVERY MODE
03/31/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/535,047	BRETT ET AL.	
	Examiner	Art Unit	
	Zachariah Lucas	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 May 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/13/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-16 and 19-22 are pending in the application.

Election/Restrictions

2. Applicant's election without traverse of embodiments wherein the claimed polynucleotide encodes each of the HCV core, NS3, NS4B, and NS5B proteins in the reply filed on February 7, 2008 is acknowledged.

3. In view of the amendment of the claims to read on the elected invention, no claims are withdrawn.

4. Claims 1-16 and 19-22 are under consideration.

Priority

5. It is requested that the Applicant amend the specification to indicate that the present application is a national stage entry, rather than a 371, of the indicated PCT application.

Information Disclosure Statement

6. The information disclosure statement (IDS) filed May 13, 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The IDS has therefore not been considered beyond the U.S. patent publication and the following references which have been relied on by the Examiner: WO 01/38360, WO 97/47358.

Drawings

7. The application is objected as lacking a Brief Description of the Drawings as required by 37 CFR 1.74. See e.g., MPEP 608.01(f).

8. It is requested that pages 2-5, 8, and 12 of the drawings be amended to indicate that these sheets are continuations of a prior Figure (e.g., by heading the sheets with the title such as - - Fig. 1 continued- -).

Specification

9. The specification is objected to for referring to protein or nucleic acid sequences without also identifying them by the sequence identifier assigned to them in the sequence listing as required by 37 CFR 1.821(d). See e.g., Figures 1-6, and pages 25-27 and 34. The examiner would like to bring the applicant's attention to the following excerpt from MPEP §2422.03:

> 37 CFR 1.821(d) requires the use of the assigned sequence identifier in all instances where the description or claims of a patent application discuss sequences regardless of whether a given sequence is also embedded in the text of the description or claims of an application. This requirement is also intended to permit references, in both the description and claims, to sequences set forth in the "Sequence Listing" by the use of assigned sequence identifiers without repeating the sequence in the text of the description or claims. Sequence identifiers can also be used to discuss and/or claim parts or fragments of a properly presented sequence. For example, language such as "residues 14 to 243 of SEQ ID NO:23" is permissible and the fragment need not be separately presented in the "Sequence Listing." Where a sequence is embedded in the text of an application, it must be presented in a manner that complies with the requirements of the sequence rules.

The applicant is therefore required to amend the specification to comply with 37 CFR 1.821(d).

10. The disclosure is objected to because of the following informalities: it appears that the identification of the lanes in Figure 16 provided on page 36 do not correspond to the proteins found in the lanes of the α-NS3 blot shown in lanes 6, 8, and 9 of that Figure.

Appropriate correction is required.

Applicant is warned against the insertion of New Matter.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims each depend from claim 6 which reads on a polynucleotide formed by the fusion of sequences encoding for each of the HCV proteins of claim 1. Claim 7 purports to further limit the polynucleotide of claim 6 to embodiments wherein "the fusion is a double fusion of the polypeptide sequences NS4B and NS5B." Claim 8 purports to limit claim 6 to embodiments wherein "the fusion is a double fusion of the polypeptide sequences NS3 and Core." In each case, the term "the fusion" relates back to the fusion of claim 6 which is a fusion encoding each of the four identified proteins. Thus, claims 7 and 8 appear to be redefining the term "the fusion" to exclude the presence of two of the protein coding sequences required by claim 6. It is therefore not clear what the scope of the rejected claims is.

For the purposes of this action, the claims are interpreted as requiring that each of the HCV proteins indicated by the claim is present is a fusion protein encoded by the claimed polynucleotide.

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 1-16 and 19-22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for immunogenic compositions against HCV, or methods of inducing an anti-HCV immune response, does not reasonably provide enablement for anti-HCV vaccines or methods of vaccinating an individual against HCV. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. It is noted that claim 21 specifically requires that the method is for the treatment or prevention of HCV infection.

In making a determination as to whether an application has met the requirements for enablement under 35 U.S.C. 112 ¶ 1, the courts have put forth a series of factors. See, In re Wands, 8 USPQ2d 1400, at 1404 (CAFC 1988); and Ex Parte Forman, 230 U.S.P.Q. 546 (BPAI 1986). The factors that may be considered include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. Id. While it is not essential that every factor be examined in detail, those factors deemed most relevant should be considered.

The present claims are drawn to vaccines against HCV, or methods of vaccinating against the virus. The term vaccine is understood in the art as referring to compounds that induce protective immune responses in individuals against a target pathogen. I.e., a vaccine, or a method of vaccination, will provide a therapeutic benefit to a patient to whom it is administered. Such is consistent with the meaning of the term as described by the present application. See e.g., pages

15 and 17 (indicating that the claimed vaccines are "therapeutic" in nature). Thus, the present claims require that the claimed compositions be capable of providing a therapeutic benefit against HCV infection.

In support of the claimed inventions, the application demonstrates that DNA compositions encoding the indicated HCV proteins results in the induction of anti-HCV cellular immune responses. Pages 27-29. However, the application nowhere demonstrates protective or therapeutic benefit against HCV viruses in an accepted model of HCV infection.

In contrast to the assertion of the present application that the indicated compositions may be used in an anti-HCV vaccine, the art indicates that there are have been significant issues in the development of such vaccines, and that, as yet, no effective HCV immune based therapy has been shown effective. See e.g., Rollier et al. J Virol 78: 187-96, page 187; and Heile et al, J Virol 74: 6885-92, page 6885 (each teaching that there are currently no anti-HCV vaccines, and that there are no "satisfactory" therapeutic treatments, and that the most effective treatments involve compositions not comprising HCV antigens- each of record in the August 2006 IDS). These references teach that the development of HCV vaccines has been problematic. Rollier, supra. Further, the failure to develop HCV vaccines and therapies have occurred despite the abundance of references through the past 10 years teaching the efficacy of HCV antigens in eliciting humoral and cellular immune response in several infection models. See e.g., Koziel et al., J Virol, 67: 7522-32. See also Lazdina et al., J Gen Virol 82:1299-1308 (indicating that the lack of such therapeutic compositions has persisted despite knowledge in the art of HCV $CD4^+$ epitopes and the use of DNA delivery and expression of such). In view of the complexity, unpredictability, and limited success in the art, and the lack of any evidence of therapeutic effect

using the indicated compositions in the application, there is insufficient information to provide enabling support for the use of the claimed compositions as an anti-HCV vaccine. Thus, while the claims may be enabled for immunogenic compositions, because the claims are drawn to vaccines they are rejected as exceeding the scope for which an enabling disclosure has been provided.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1-4, 6-9, 12, 19, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coit et al., (WO 01/38360- of record in the M ay 2005 IDS). These claims are directed to a composition comprising a polynucleotide that encodes the HCV Core, NS3, NS4B, and NS5B proteins, and no other HCV proteins. Claim 3 requires that the Core protein is C-terminally truncated by at least 10 amino acids. Claims 4 and 5 indicate that the core is truncated at positions 151. Claim 7 and 8 respectively require that the NS4B and NS5B proteins, or the core and NS3 proteins, are part of a fusion protein. Claim 12 requires that at least one of the proteins is rendered non-functional. Claim 19 requires that the polynucleotide is in the form of a plasmid, and claim 21 reads on a method for the administration of such to a mammal. Claim 22 requires that the polynucleotide is delivered by coating it onto a gold particle, and delivering such into the skin.

Coit teaches an HCV NS polypeptide comprising the NS3, NS4, and NS5 proteins, and suggests embodiments wherein the NS4 and NS5 proteins are the NS4B and NS5B proteins. See e.g., claims 1, 4, and page 3. The reference also teaches embodiments additionally comprising the Core (C) protein, esp. a truncated C protein, and polynucleotides encoding such proteins. Claims 12-15, and 21-21. In particular the reference teaches that the use of a truncated C protein results in greater expression of a fusion protein comprising the C and NS proteins. Page 26. However, the reference also teaches that it would have been obvious to use longer Core proteins (such as lengths of 140 or 150 aa) for the purpose of including additional epitopes. It would therefore have been obvious to those of ordinary skill in the art to optimize the length of the core protein included in the polynucleotide taking into consideration such factors as the epitopes included and the expression of the NS proteins. The truncated proteins of the present claims would therefore have been obvious through routine optimization of the core proteins.

The Coit reference also teaches that the polynucleotide may be in the form of a plasmid, and methods of inducing an immune response through the administration of such to a mammal. Claims 23 and 42. The reference also suggests embodiments wherein the NS3 protein is rendered non-functional (page 11). The reference also teaches that the polynucleotides may be delivered using a gene gun, wherein a particulate carrier such as gold is coated with the polynucleotide and delivered to the skin. Page 44, lines 16-22.

From these teachings, it would therefore have been obvious to those of ordinary skill in the art to have made, and administered to a mammal, a composition comprising a polynucleotide encoding the HCV Core, NS3, NS4B, and NS5B proteins, including embodiments wherein the

Core protein is truncated, and at least one of the proteins is rendered non-functional (e.g., the NS3 protein). The rejected claims are therefore obvious over the teachings of Coit.

17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of Leroux-Roels et al. (Hepatology 23:8-16) This claim reads on the polynucleotide compositions described above, wherein the core protein terminates at position 165.

As indicated above, Coit indicates that it would have been obvious to those of ordinary skill in the art to adjust the length of the core protein encoded by the polynucleotide to include epitopes but also to permit NS protein expression. However, the reference does not provide a motivation to terminate at position 165. Leroux-Roels teaches that a core protein epitope terminates at position 164. See e.g., abstract, and page 10, Table 1. It would therefore have been obvious to those of ordinary skill in the art to have extended the core protein of Coit in include such an epitope. The combined teachings of the art therefore render the claimed invention obvious.

18. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of Paliard et al. (U.S. 6,562,346) in view of Krohn et al., (U.S. 2003/0129169). These claims are directed to embodiments of the claimed polynucleotides, wherein the polynucleotide comprises at least two expression cassettes, and wherein the core protein is encoded by a cassette downstream of a second cassette (esp. one encoding the NS5B protein).

The teachings of Coit have been described above. The reference teaches a composition wherein each of the indicated HCV proteins are part of a single protein or polypeptide. However, it was known in the art that a combination of individual peptides was a functional equivalent of such a fusion protein. See e.g., Paliard, abstract. Additionally, it was also known in the art that a single vector could include a plurality of expression cassettes directed to different proteins. See e.g., Krohn, page 5 (paragraphs [0059]-[0060]), and claim 16. In view of the teachings of Paliard, indicating that polynucleotides encoding a plurality of individual proteins is a functional equivalent of a polynucleotide encoding a fusion comprising each of those protein, and in view of the teachings of Krohn indicating that it was known in the art to make vectors comprising a plurality of expression cassettes directed to different proteins of interest, it would have been obvious to those of ordinary skill in the art to have made a vector comprising a plurality of the such cassettes for the individual expression of the proteins indicated by Coit. The relative placement of the various cassettes would have been obvious as a matter of design choice.

It is noted that the application demonstrates that placement of the core coding cassette upstream of the cassettes encoding the NS34B5B or NS4B5B fusions results in decreased expression of the fusions. However, these results are not commensurate in scope with the claimed invention which requires only that the core be expressed downstream of the NS5 protein. The teachings of the present application fail to show any improvement in the expression of individual NS proteins, including the NS5B protein, depending on the relative placement of the expression cassette compared to a cassette expressing the core protein in cis.

19. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of Cheney et al. (Virol 297:298-306). This claim requires that the claimed polynucleotide includes an NS5B coding sequence in which there in an inactivating mutation in motif A of the protein.

The teachings of Coit have been described above. The reference indicates that the NS proteins may include mutated forms of the protein. Further, the reference indicates that the mutants need only retain the cell-mediated immunogenicity of the proteins to be used in the described invention. Page 11. From these teachings, it would have been apparent to those of ordinary skill in the art that inactivated forms of the proteins would act as functional equivalents for the encoded proteins.

Cheney teaches that the activity of the NS5B protein may be reduced through a mutation in motif A of the protein. See e.g., Figures 1 (page 300) and 4 (page 302).it would therefore have been obvious to those of ordinary skill in the art to have included such a mutation in the NS5B encoded by the disclosed polynucleotide. The combined teachings of these references therefore render the claimed invention obvious.

20. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of Grakoui et al. (J Virol 67:2832-43). This claim requires that the claimed polynucleotide includes an NS3 coding sequence in which there in an inactivating mutation in the catalytic triad of the NS3 protein.

As indicated above, the Coit reference teaches a polynucleotide that includes a fusion of sequences encoding an HCV core and NS proteins. The reference also indicates that the NS3

protein's activity may be abrogated by either a deletion or a substitution of the catalytic domain. However, the reference does not teach that the substitution is a mutation of one of the catalytic triad amino acids.

However, the teachings of Grakoui show that the NS3 catalytic domain may be disrupted through the modification of one of the member amino acids of the catalytic triad. Based on these teachings, it would therefore have been obvious to those of ordinary skill in the art that one of these substitutions may be made in the place of the substitution in Coit claim 3. The combined teachings of these references therefore render the claimed invention obvious.

21. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of Tai et al. (J Virol 75:8289-97). This claim requires that the claimed polynucleotide includes an NS3 coding sequence in which there in an inactivating mutation in one of the four indicated helicase motifs.

As indicated above, the Coit reference teaches a polynucleotide that includes a fusion of sequences encoding an HCV core and NS proteins. The reference also indicates that the NS3 protein's activity may be abrogated by either a deletion or a substitution of the protein. However, the reference does not teach that such may be accomplished through the mutation of a helicase motif. The teachings of Tai do however indicate that the activity of NS3 may be abolished through certain mutations to NS3 helicase motifs. See e.g., page 8292 (Table 2). It would therefore have been obvious to those of ordinary skill in the art

22. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of the teachings of Fields et al. (U.S. 2002/0090607) and Lauer et al. (J Virol 76:6104-13). This claim is drawn to the polynucleotide compositions described above, wherein the NS4B protein is truncated to lack the N-terminal variable region, which the application indicates is found within the first 48 amino acids of the protein.

The teachings of Coit indicate that the full-length proteins, thus protein coding regions in the polynucleotides, need not be used. Page 10. The reference indicates that fragments of the proteins that retain the desired activity (ability to induce an anti-HCV response), particularly where the fragment includes an epitope of the protein. See e.g., pages 10 (lines 4-26), 11 (lines 8-18), and 12 (lines 4-31). However, the reference does not disclose any specific fragments or truncations of the NS4B protein.

However, other teachings in the art indicate that the NS4B fragment comprising residues 1789-1867 of the HCV polyprotein is a preferred antigenic fragment of this protein for inclusion in an antigenic HCV protein. Fields, page 1 (paragraphs [0009]-[0011]). It is noted that this fragment of the NS4B protein lacks the first 48 residues of the NS4B protein (corresponding to residues 1712-1760 of the HCV polyprotein). Moreover, while the Fields reference indicates that the NS4B protein described therein would induce an antibody response (page 4), other teachings in the art indicate that this fragment of the protein includes identified T-cell epitopes of the protein. See e.g., Lauer, page 6105 Table 2 (showing that NS4B T-cell epitopes between positions 1789 and 1859). It would therefore have been obvious to those of ordinary skill in the

art to have used this NS4B protein fragment in the composition described by Coit. The combined teachings of the cited references therefore render the claimed invention obvious.

23. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coit as applied to claims 1-4, 6-9, 12, 19, 21, and 22 above, and further in view of Donnelly et al. (WO 97/47358- of record in the May 2005 IDS). This claim is directed to the polynucleotide of claim 1, wherein the polynucleotide is codon optimized for expression in mammalian cells. The teachings of Coit have been described above. As indicated above, the reference teaches the use of such polynucleotides for administration to a mammal for the induction of an anti-HCV immune response. However, the reference does not teach the use of codon optimization.

The use of codon optimization, including for HCV antigen encoding polynucleotides for use in a DNA vaccine, was known in the art. See e.g., Donnelly, pages 9-10 and 17-20. It would therefore have been obvious to those of ordinary skill in the art to have used such codon optimization for the polynucleotides of Coit. The combined teachings of these references therefore render the claimed invention obvious.

24. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Double Patenting

25. Applicant is advised that should claim 1 be found allowable, claim 6 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Claim 1 reads on **a polynucleotide** encoding each of the indicated HCV proteins. Claim 6 reads on the polynucleotide of claim 1 which is "a fusion containing at least one sequence encoding the HCV proteins." Thus, claim 6 reads on a single polynucleotide wherein the coding sequences for the various HCV proteins are fused together. Because claim 1 already requires that the coding sequence for each of the proteins is present in a single polynucleotide, the scope of claim 6 is identical to that of claim 1.

26. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In *re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

27. Claims 1-11 and 19-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13, and 15-19 of copending Application No. 10/534774. Although the conflicting claims are not identical, they are not patentably distinct from each other because the copending claims read on a species of the presently claimed invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

28. Claims 12-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim1-13 and 15-19 of copending Application No. 10/534774 in view of the teachings of, respectively, Cheney, Grakoui, Tai, and of Fields and Lauer. The claims have been described above. The copending claims read on polynucleotides comprising NS3, NS4B, and NS5B proteins. However, the copending claims are silent as to any mutations that may be made to the proteins. However, it would have been obvious to those of ordinary skill in the art to have modified such proteins as described by the indicated references for the reasons indicated in the rejections above. The present claims therefore represent an obvious variant of the copending claims.

This is a provisional obviousness-type double patenting rejection.

Conclusion

29. No claims are allowed.

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachariah Lucas whose telephone number is (571)272-0905. The examiner can normally be reached on Monday-Friday, 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on 571-272-0974. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zachariah Lucas/
Primary Examiner, Art Unit 1648